



Competitive Carriers Association
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January 31, 2013

Via ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: WT Docket No. 12-69

Dear Ms. Dortch:

Restoring interoperability in the 700 MHz band is straightforward. Therefore, Competitive Carriers Association (CCA) requests that the FCC immediately require all Lower 700 MHz devices to operate on a single, unified Lower 700 MHz band class by a date certain.¹ As we've noted before, industry can best determine the mechanisms to satisfy that requirement. Different implementation deadlines and mechanisms may generate slightly different costs and benefits, but in each case the costs are small and largely avoidable if the Commission acts promptly, while the benefits are large, widely shared, and especially meaningful to consumers.

Robust development of LTE technology rests upon ensuring that the smallest number of band classes covers the largest amount of spectrum possible.² As AT&T has repeatedly recognized in proceedings other than this one,³ wider, more inclusive band classes allow for greater economies of scale that generate tremendous public interest benefits, including:

¹ CCA merely requests that the FCC restore interoperability as Lower A block licensees expected at the time they purchased this spectrum at auction

² See Neal Gompas, What is LTE-Advanced?, EXTREME TECH, Aug. 29, 2012, <http://www.extremetech.com/mobile/135045-what-is-lte-advanced/5> (noting that several separate band classes exist for portions of the 800-900MHz range: Band Class 5 (Cellular 850 used in the Americas, Oceania, and South Korea), Band Class 6 (subset of Cellular 850 used in Japan), Band Class 18 (ESMR 800 used by Sprint in the US, Telus in Canada, and KDDI in Japan), and Band Class 19 (expanded version of band class 6 for Japan)).

³ In November 2012, for example, J.R. Wilson, Vice President of Partnerships and Alliances for AT&T Mobility, offered extensive comments concerning the evolution of Wi-Fi networks and services. When asked about the priorities of the Wireless Broadband Alliance (WBA), where he serves as Chairman, AT&T's Wilson raised the need for interoperability:

When it comes to interoperability, reducing friction is essential. Today, achieving Wi-Fi roaming agreements between carriers is not as simple as it should be, often due to lack of common specifications and a somewhat complex process to reach an agreement

See INFORMA TELECOMS & MEDIA, WBA Wi-Fi INDUSTRY REPORT: GLOBAL TRENDS IN PUBLIC Wi-Fi 4-5 (2012), http://www.informatandm.com/wp-content/uploads/2012/11/WBA_final-pdf.pdf. When asked about the main obstacles to Wi-Fi's growth and expansion, Wilson replied that interoperability is essential:

For Wi-Fi to realize its full potential, the industry needs a common set of agreements, standards, implementation practices and interoperability guidelines that outline how operators can easily connect with

- reduced network and equipment costs for carriers;
- lower development costs for vendors;
- accelerated design and production times for manufacturers;
- reduced switching costs for consumers; and
- accelerated innovation for the industry as a whole, including build-out of new, mobile, high-speed broadband networks and services.⁴

AT&T does not seriously contest any of these widely recognized benefits of scale economies in the wireless industry. Rather it claims that few, if any, of the benefits will actually occur in this case because not all Lower 700 MHz A Block licenses fall back to the same 3G GSM air-interface that AT&T uses.⁵

This argument is fallacious. Lower 700 MHz A Block licensees that fall back to CDMA or another non-GSM air interface technology will benefit greatly from requiring support for a single, unified 700 MHz band. The reason is simple: Qualcomm, “the largest provider of wireless chipset and software technology, which powers the majority of all 3G devices commercially available today,” produces multi-technology chipsets.⁶ Multi-technology chipsets allow Qualcomm to use the exact same chip for CDMA and GSM and LTE. Changing firmware on the chip allows the exact same chipset to support multiple air interfaces.⁷ As Qualcomm itself recently explained to NTIA, “because Qualcomm’s

one another. One key priority is ensuring that device manufacturers are supportive and that the right technology is both in the network and on the devices to guarantee NGH [Next Generation Hotspot] compatibility. Adoption of these guidelines and standards by WBA members and across the Wi-Fi ecosystem are critical for Wi-Fi growth.

Id. And on the subject of encouraging new business models, Wilson added that “[i]t’s essential that Wi-Fi becomes truly secure, seamless and interoperable so new business models and growth opportunities will build on this “next generation” Wi-Fi technology platform.” *Id.* Randall Stephenson, the CEO of AT&T Inc., has similarly acknowledged the importance of interoperability in the wireless ecosystem. In a recent interview at the Mobile World Congress on CNBC, he said: “I think all of us in this industry have a common goal and that is to make this pie bigger. We want more ubiquitous utilization of mobile broadband capabilities. And to the extent you desire that, history has shown that we have to make all of these networks, we have to make all of these operating systems, interoperable. And so to the extent that we can get more openness, more seamlessness, more interoperability among network providers, among apps, among OSs and devices, then the bigger we make this pie, we cause this thing to grow much faster and make it a much more pervasive part of business and society.” The full video interview is available at <https://www.dropbox.com/s/6k820ca89c0boff/RandellStevensonMWC.wmv>.

⁴ See, e.g., Letter by Cellular South (C Spire Wireless) to Marlene H. Dortch, Secretary, FCC, WT Docket No. 12-69 (Jan. 14, 2013); Notice of *Ex Parte* of MetroPCS Communications, Inc., WT Docket No. 12-69 (Dec. 7, 2012); *Ex Parte* Presentation by U.S. Cellular, The Importance of Lower 700 MHz Interoperability to the Development of the LTE Ecosystem, WT Docket No. 12-69 (Dec. 5, 2012); Notice of *Ex Parte* of Vulcan Wireless LLC, WT Docket No. 12-69 (Nov. 30, 2009); Notice of *Ex Parte* of King Street Wireless, WT Docket No. 12-69 (Oct. 31, 2012).

⁵ See, e.g., Comments of AT&T Services, Inc., WT Docket No. 12-69, at 10-16 (June 1, 2012); Reply Comments of AT&T Services Inc., WT Docket No. 12-69, at 10-16 (July 16, 2012); Reply Comments of AT&T Services, Inc., Attachment B: Report of Mark A. Israel, Michael L. Katz & Allan L. Shampine, WT Docket No. 12-69, at 24-26 (July 16, 2012); Reply Comments of AT&T Services Inc., Attachment C: Reply Declaration of Michael Prise & Jeffrey Howard, WT Docket No. 12-69, at 4-10 (July 16, 2012).

⁶ Qualcomm, *Our Businesses*, available at <http://www.qualcomm.com/about/businesses> (last visited Jan. 16, 2013). Further, Qualcomm’s production of multi-technology chipsets does not represent some esoteric venture, but makes sound business sense for the company. The leader in CDMA technology, Qualcomm must also compete for GSM business and, looking forward to 4G and the convergence around the LTE air interface, has gravitated to producing multi-technology chipsets as a way of maximizing its addressable market. While some GSM-only chipsets certainly exist, the number of these chipsets, especially in the United States market, pale in comparison to the number of multi-technology chipsets produced by Qualcomm.

⁷ The original equipment manufacturer, in other words, does not have to change anything in their hardware to allow CDMA carriers to enjoy the scale economies of Band Class 12 devices. A CDMA carrier would simply have their Qualcomm

chipsets are multi-mode and multi-band, all chipsets that support 4G also support 3G and 2G technologies.”⁸ Therefore, so long as the chip supports the wider Band Class 12 band specification rather than the narrower Band Class 17 band specification, the scale economies of interoperability cascade to GSM and CDMA carriers alike. A carrier’s choice of CDMA or GSM or other 3G “fall back” technology is irrelevant.

Further (and more obvious), some Lower 700 MHz A Block licensees will fall back to GSM technology at 3G, and at least some operators will have no fall back technology at all. As more operators converge around LTE, moreover, the issue of fall back becomes increasingly irrelevant. Just as operators no longer worry about falling back to AMPS, they will no longer worry about falling back to GSM or CDMA. Therefore, even if the choice of fall back technology somehow affected the ability to achieve scale economies with the primary LTE technology, Lower 700 MHz A Block licensees that fall back to GSM (or do not fall back to 3G at all) would still enjoy the benefits of interoperability. But the Commission must act now to prevent a multitude of overlapping, exclusive LTE bands from becoming the norm for 4G LTE.

On the cost side, transitioning to a single, unified Lower 700 MHz band need not impose material costs on AT&T. While AT&T can surely imagine more costly ways to implement an interoperability requirement, AT&T can avoid most costs associated with a single unified Lower 700 MHz band by simply directing its manufacturers to incorporate Band Class 12 duplexers rather than Band Class 17 duplexers into its devices.⁹ Band Class 12 components are pin-compatible with existing hardware and, as a result, require no design adjustments to the end user equipment or any of its constituent parts.

On a going forward basis, the only hardware change necessarily associated with a unified Lower 700 MHz band mandate is inserting the interoperable Band Class 12 duplexer rather than the non-interoperable Band Class 17 duplexer into the handset at the time of manufacture. The Band Class 12 component itself involves no more complexity than the Band Class 17 component. And assuming, as seems entirely reasonable, that the same or greater level of volume purchasing occurs following adoption of the unified Lower 700 MHz band requirement as before, the Band Class 12 duplexer should cost the same or *less* than the Band Class 17 duplexer does today, given the larger scale. On the software side, software for Band Class 12 devices has already been developed and deployed in the field; therefore, no device software development costs should be associated a unified Lower 700 MHz band requirement.

On the network side, no hardware would change as a result of a single, unified Lower 700 MHz band and AT&T would not incur any additional hardware costs at the base station. AT&T would, however, need to install software on its network to support Band Class 12 and, depending on exactly when the deadline for a unified Lower 700 MHz Band is established,¹⁰ AT&T may also want to deploy a

multi-technology chipsets receive a software load for the CDMA air interface while devices destined for AT&T would receive a GSM software load.

⁸ Comments of Qualcomm Inc., Development of the Nationwide Interoperable Public Safety Broadband Network, Docket No. 120928505-2505-01, at 7 (Nov. 9, 2012), available at http://www.ntia.doc.gov/files/ntia/qc_comments_on_firstnet_noi.pdf.

⁹ Lower 700 MHz A Block licensees already incorporate Band Class 12 duplexers in lieu of Band Class 17 duplexers in just this manner. Without a single, unified Lower 700 MHz band, however, the lower production volumes currently associated with Band Class 12 duplexers result in systematically higher costs and chronically longer development timeframes for the Lower 700 MHz A Block licensees compared to those AT&T enjoys.

¹⁰ If the date certain for a unified Lower 700 MHz band were to fall more than two years from adoption of an order – an option CCA strongly disfavors – supporting legacy Band Class 17 devices becomes less of a consideration due to limitations on the useful life of 4G LTE end user equipment. Assuming that the date certain to require devices support a single, unified Lower 700 MHz band plan is between zero and eighteen months of adoption, support for legacy Band Class 17 devices becomes a more relevant consideration.

software update to support legacy, non-interoperable Band Class 17 handsets. Although ensuring that the base stations can recognize Band Class 12 and legacy Band Class 17 devices would require AT&T to deploy a software update to its base stations and existing Band Class 17 devices, the software update would *not* require a site visit to the base stations. Instead, as is typically the case, the software update would occur during the regularly scheduled electronic distribution of software adjustments to the base station.¹¹ Unlike the distribution of the software, which would occur as a part of standard network operating practices and involve no additional activity or expense, the *development* of the network software necessary to recognize Band Class 12 devices and Band Class 17 devices for a period of time would entail some modest costs.¹² As a practical matter, software for both band classes already exists and most of the coding associated with the necessary software update would not change. Nonetheless, certain adjustments to the current coding would need to be made to ensure devices are properly recognized and their channelization formats properly loaded onto the network.

Based on information received from software vendors, CCA believes that these software development costs would not exceed \$2 million. This amount would represent a tiny fraction of the software development costs associated with an LTE network, an even tinier fraction of the combined cost of the hardware and software associated with the LTE system, and a tinier fraction still of the total costs a carrier must incur to provide services to a consumer. Thus, while some software development costs will be incurred if the Commission were to require a near-term unified Lower 700 MHz band, those costs are comparatively small and so attenuated relative to the total costs of providing service that it would be difficult to account for them.¹³ At the same time, the overwhelming benefits to consumers, competitive carriers and the wireless marketplace are enormous and long-lasting.

As its first action towards restoring interoperability, the Commission must require a dual band solution as a transitional step. During the transition, as CCA and its members have long-stated, the costs of incorporating Band Class 12 into a Band Class 17 device are minimal.¹⁴ Assuming use of standard and non-custom components, which are currently available in high volume production, the price difference between a Band Class 17 device and a device supporting both Band Class 17 and Band Class 12 is approximately \$0.20 to \$0.60 per device.¹⁵ When considering a \$600 device, this additional cost represents only 0.10% of total cost at most. For example, the incremental cost difference based on teardown information for the HTC One X would be \$0.58, or less than 0.12% of AT&T's advertised regular price of \$499.00¹⁶ (and less than 0.3% of the device's total bill of materials). This includes all component costs for support of multiple bands, including power amplifiers, duplexers, and filters.¹⁷

¹¹ These updates usually occur at intervals of every six to twelve months and involve transmitting a program remotely from the Network Operations Center (NOC) over the fiber or T-1 connection to the base station, where the program is downloaded to the base station control unit. While specific base station configurations can vary by vendor, they typically consist of two or more computer servers. The typical practice for accepting a download is to install the program on one computer and then reset the base station to operate using the updated computer. If the base station performs as expected, then the same update is loaded to the other computer and the software upgrade of the base station is complete.

¹² These costs would include the process of obtaining 3GPP approval for the minor software adjustment necessary to support legacy devices at the network layer – an event that CCA's member companies would actively support and one which, CCA believes, could occur very quickly if AT&T were to join CCA member companies in supporting the change.

¹³ Responsibility for the limited incremental cost of supporting legacy Band Class 17 devices properly rest with AT&T in any case. AT&T developed Band Class 17 after the Commission concluded the auction of a single, unified Lower 700 MHz band. To the extent AT&T must bear some minor software development costs to restore a single, unified Lower 700 MHz band, those costs stem from AT&T's business and design choices to deviate from the auctioned band plan.

¹⁴ Notice of *Ex Parte* of Vulcan Wireless LLC, WT Docket No. 12-69 (Nov. 30, 2012); Notice of *Ex Parte* of Vulcan Wireless LLC and Cellular South, Inc. d/b/a C Spire Wireless, WT Docket No. 12-69 (Nov. 14, 2012).

¹⁵ See IHS, Inc., *Multiband LTE Cost Delta Analysis* (Jan. 2013), a copy of which is attached to this correspondence ("IHS Analysis").

¹⁶ HTC One X – Gray cell phone from AT&T, <http://www.att.com/show/wireless/devices/htc/one-x-gray.html>

¹⁷ See generally IHS Analysis.

These economies of scale, however, are possible only when considering the economies of scale of the entire Lower 700 MHz ecosystem. Further, this minimal additional cost per device is projected to decrease over time, and upon transition to a unified band class will go away entirely, as the cost estimates between specific bands are negligible. As this transition takes place, it is in the interest of all stakeholders to work quickly towards a unified band class for the Lower 700 MHz band. This will finally eliminate an unnecessary additional band class among a growing number of LTE bands and simplify device production while increasing support for roaming.

In summary, the immense benefits of restoring interoperability to the Lower 700 MHz band occur regardless of fall back technology.¹⁸ Achieving these benefits does not require carriers to use the same 3G technology as AT&T—carriers with 3G GSM fall back or no fall back at all will benefit from a unified band. Finally, the benefits of a single, unified Lower 700 MHz band greatly outweigh the small, network-side software development costs necessary for interoperability. The Commission should act quickly to restore interoperability to the Lower 700 MHz band.

Sincerely,

/s/

Rebecca Murphy Thompson
General Counsel

Attachment

cc (*via* Email): Ruth Milkman
Jim Schlichting
Tom Peters
Nese Gundelsberger
Nicole McGinnis
Jonathan Chambers
Renee Wentzel
Louis Peraertz
Henning Schulzrinne

¹⁸ See Peter Cramton, *700 MHz Device Flexibility Promotes Competition*, (Aug. 9, 2010), attached to Ex Parte Letter from Rebecca Murphy Thompson, General Counsel for Rural Cellular Association, to Marlene H. Dortch, Secretary, FCC, filed in RM-11592 (Aug. 10, 2010); Dr. Raul L. Katz, et al., *Economic Impact of Wireless Broadband in Rural America*, Telecom Advisory Services, LLC (2011), available at http://www.teleadvs.com/wp-content/uploads/RCA_FINAL.pdf; Letter by Cellular South (C Spire Wireless) to Marlene H. Dortch, Secretary, FCC, WT Docket No. 12-69 (Jan. 14, 2013).